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WPNSSB

AN1SM-A

ANALYZER, SPECTRUM

1. GENERAL. This procurement requires a bench-top spectrum analyzer.

2. CLASSIFICATION. Type II, Class 5, Style E, and Color R in accordance with MIL-T-28800 for shipboard applications.

3. MEASUREMENT REQUIREMENTS. The equipment shall be capable of spectrum analysis within the following minimum specifications.

3.1 Frequency specifications.

3.1.1 Center frequency range. 100 Hz to 1.5 GHz.

3.1.2 Center frequency accuracy. ±[2% of span + (reference accuracy x tuned freq.) + 10 Hz]. Reference frequency accuracy: 1x10E-9/day and 1x10E-7/yr. Inaccuracy due to temperature shall be no more than 7x10E-9/degree C away from 23 degrees C and within the operating temperature range specified in MIL-T-28800.

3.1.3 Center frequency tuning resolution. 1% or less of the selected span.

3.1.4 Tuned frequency stability. After a 1 hour warmup, the frequency drift shall not exceed 10 Hz per minute of sweep time for spans of 100 kHz or less.

3.1.5 Delta frequency. A mode of operation shall be provided wherein the frequency readout indicates the frequency difference of two independently variable markers. Delta frequency readout resolution: 1 Hz or less. Delta frequency accuracy: ±5% of the selected span.

3.1.6 Signal frequency counter. The equipment shall be capable of counting the frequency of signals within the specified frequency range. Accuracy of indication: For spans of $\leq$ 100 kHz: ±[(reference accuracy x indication) + (2 x counter resolution). Accuracy shall degrade to no more than $\pm$[10 kHz + (2 x counter resolution)] for any span setting.

3.1.6.1 Signal counter resolution. Selectable from 1 Hz to 1 MHz.

3.2 Span modes. A mode shall be provided wherein the full specified frequency range for each band is displayed. A mode shall be provided wherein the CRT horizontal axis is calibrated in time instead of frequency. A method for selecting spans shall be provided wherein the total span of the horizontal graticule area shall be selectable from 100 Hz to 1 GHz typically with seven ranges in a 1,3,10 sequence.

3.2.1 Span accuracy. ±5% of the selected span over the center 80% of the graticule area.

3.3 Residual FM. 3 Hz peak-to-peak maximum for spans less than 100 kHz and resolution bandwidths less than or equal to 30 Hz.

3.4 Resolution bandwidth. Selectable from 10 Hz to 3 MHz with at least 7 bandwidths. Accuracy: ±20% of the selected bandwidth. Shape factor: 15:1 measured between the 3 and 60 dB points.

3.4.1 Video filter. Selectable video filters of 1 Hz to 3 MHz shall be provided.

3.5 Input specifications.

3.5.1 Input impedance. 50 ohms nominal. 1.5:1 maximum VSWR with 10 dB or more input attenuation selected.

3.5.2 Maximum input. 30 dBm continuous and 100W peak for 10 us or greater with 50 dB or less attenuation selected. Input connector shall be type N(f).

3.6 Display.

3.6.1 Display dynamic range. 90 dB in log mode and eight divisions in linear mode.

3.6.2 Display accuracy. 0.1 dB per dB with a maximum of ±2 dB in log mode, and ±5% in linear mode.

3.6.3 Display flatness. When measured with 10 dB of input attenuation and referenced to the internal calibrator frequency, the displayed flatness shall not exceed ±1.5 dB.

3.6.4 Vertical display scales. Log 10 dB/div, 5 dB/div, 2 dB/div, 1 dB/div and linear volts/div1.

3.7 Distortion.

3.7.1 Spurious noise. -70 dBc with a mixer level of -40 dBm and an input signal frequency of less than 10 MHz.

3.7.2 Harmonic distortion. -60 dBc for a signal mixer level of -40 dBm and an input signal frequency of less than 10 MHz.

3.8 Noise sidebands. The noise sidebands shall be at least -110 dBc/Hz at offsets from a 20 MHz carrier of 100 Hz or greater.

3.9 Input attenuator. 0 dB to 70 dB in 10 dB steps. Attenuator accuracy: ±0.6 dB/STEP, ±2.1 dB maximum cumulative.

3.10 Reference level range. -100 dBm to 30 dBm for log modes and 2.2 uV to 7V in linear mode. The reference level shall be adjustable in increments of 0.25 dB or less for the log mode and to one division or less in the linear mode.

3.11 Sweep time. 1 us to 1500s in zero span mode. Accuracy: ±20% of setting. Manual and auto sweep modes shall be provided.

3.12 Trigger. Internal, external, free run, and single sweep triggering modes shall be provided.

3.13 Digital storage. The digital storage function shall be capable of storing and displaying at least six instrument setup states. When batteries are required for digital storage circuitry, they shall have a useful life of at least 12 months under normal operating conditions within the operating temperature range.

3.14 Markers. The equipment shall provide frequency and amplitude markers using

one marker for absolute measurements and two markers for relative measurements. Marker positioning will provide a readout of frequency and amplitude of any point, or the difference in amplitude or frequency between two points, along a displayed spectrum.

3.14.1 Marker amplitude accuracy. At the reference level, the marker amplitude uncertainty shall not exceed ±2 dB in log mode and ±5% in linear mode. The total uncertainty shall degrade to no more than ±7.7 dB at maximum deviation from the reference level at 23 degrees C.

3.15 CRT specifications. A display with an internal graticule of at least 10 x 10 divisions shall be provided. The display shall provide a readout of center frequency, span or span/div, resolution bandwidth, vertical scale factor, reference level, marker readout of frequency and amplitude, video filter selection, and RF attenuation. The CRT display area shall be at least 9.6 cm (3.78 in) high by 11.9 cm (4.68 in) wide.

3.16 Outputs. Outputs for an internal calibrator signal, an X-Y recorder, a penlift control, and a tracking generator shall be provided.

3.17 Reference input. Frequency: 10 MHz. Amplitude range: 0 to 10 dBm.

3.18 Calibrator signal accuracies. ±0.2 dB for amplitude, ±[calibrator freq. x freq. ref. accy] for frequency. Hz for frequency.

4. GENERAL REQUIREMENTS.

4.1 Power source. MIL-T-28800 nominal power source requirements are invoked. Maximum power consumption: 450W.

4.2 Weight. 20 kg (44 lb) maximum.

4.3 Remote control. A digital interface shall be provided in accordance with MIL-T-28800.

4.4 Lithium batteries. Per MIL-T-28800, lithium batteries are prohibited without prior authorization. A request for approval for the use of lithium batteries, including those encapsulated in integrated circuits, shall be submitted to the procuring activity at the time of submission of proposals. Approval shall apply only to the specific model proposed.